



# Planning and Investing in a Changing Climate:

## Implementation of EO B-30-15

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State Water Resources Control Board  
Water Quality Coordinating Committee Annual Meeting

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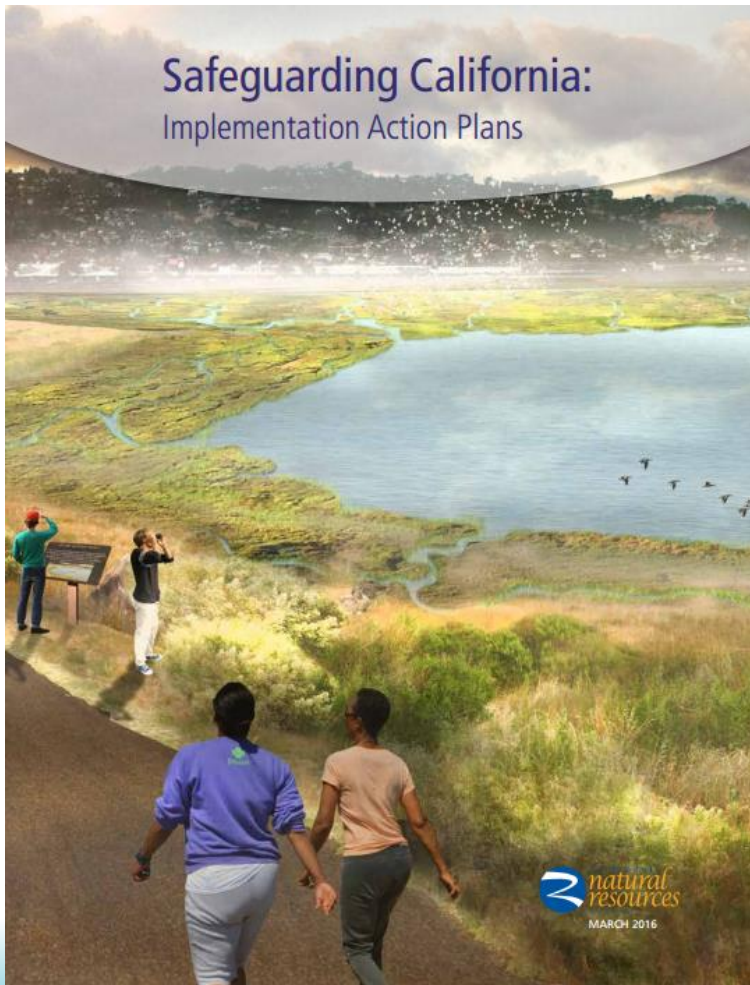
# Executive Order B-30-15

- State agencies shall take climate change into account in their planning and investment decisions, and employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives.
- State agencies' planning and investment shall be guided by the following principles
  - Priority should be given to actions that both build climate preparedness and reduce greenhouse gas emissions;
  - Where possible, flexible and adaptive approaches should be taken to prepare for uncertain climate impacts;
  - Actions should protect the state's most vulnerable populations; and
  - Natural infrastructure solutions should be prioritized.
- The state's Five-Year Infrastructure Plan will take current and future climate change impacts into account in all infrastructure projects





# *Safeguarding California* is the State's Climate Adaptation Strategy

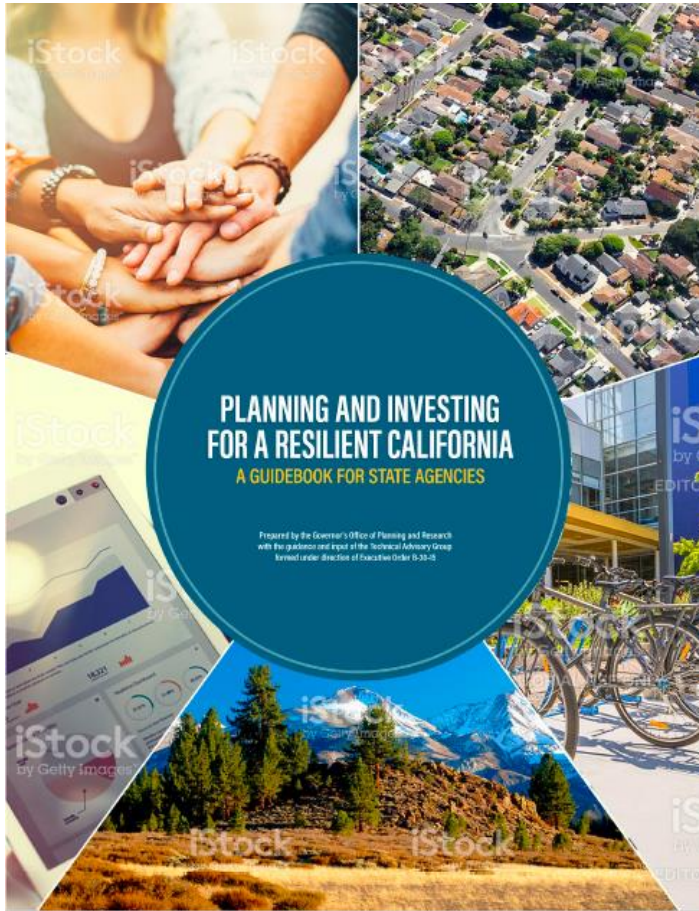


- 10 sectors
- For each sector:
  - Overview of climate risks
  - Actions to address those risks
- Executive Order B-30-15:  
Implementation Action Plans
- 2017 update is underway
- Lead: California Natural Resources Agency





# EO B-30-15 Technical Advisory Group



- Roughly 50 members
- Met from March 2016-January 2017
- Workgroups:
  - Scenarios
  - Community Development and Equity
  - Infrastructure
  - Metrics
- Product: Guidebook for State Agencies
  - What to plan for
  - How to plan differently



# A Process for State Agencies

## Step 1:

Identify how climate could affect your project or plan

- Identify impacts of concern
- Identify climate-sensitive planning parameters
- Identify metrics to track performance of plan or investment under changing climate

## Step 2:

Select an analytical approach to integrate climate change

- Consider the scale, scope, and context of climate disruption
- Select climate change scenarios and analytical approach for planning and design

## Step 3:

Make a climate-informed planning or investment decision

- Evaluate alternatives or design
- Apply resilient decision-making principles

## Step 4:

Track and monitor progress, adjust as needed

- Evaluate metrics to track progress
- Implement adaptive management approaches



# Understanding Impacts – Quantity and Quality

- Project Lifetime: The useful life of a project is important for identifying climate impacts of concern, considering both changing average conditions, occurrence of extreme events, and the pace of change.
- Scale and Scope of Risk: Consider the criticality or consequence of disruption to understand the scale and scope of the risk posed by changing climate conditions and extreme events.
- Vulnerability and Adaptive Capacity: Identify who and what is affected by climate-related disruptions to determine the vulnerability and adaptive capacity of the people, places and resources affected.
- The Nature of the Risk: Consider how a climate-related disruption will affect the ability of people, places and resources affected to adapt, learn, and prepare for future conditions.





# Working Under Uncertainty – Managing Risk

## Selection of Climate Scenarios

### Optimistic/Adaptive

- RCP 4.5 or 2.6
- Monitor and adjust
- Live with change

### Adaptive

- Mid-range RCP
- Pathways

### Precautionary

- RCP 8.5
- Sensitivity analysis with higher extremes



## Considerations

Consequences of impact or disruption	Low: Minimum disruption, limited scale and scope	Medium: Inconvenience, but limited in scope and scale	High: Unacceptable risk and/or extensive scale and scope
Nature of disruption	<ul style="list-style-type: none"> <li>• Future flexibility maintained</li> <li>• People or systems readily able to respond or adapt</li> </ul>	<ul style="list-style-type: none"> <li>• Limits future flexibility</li> </ul>	<ul style="list-style-type: none"> <li>• Irreversible</li> <li>• Threat to public health and safety</li> </ul>
Who or what is affected?	<ul style="list-style-type: none"> <li>• Low impact on communities, infrastructure, or natural systems</li> </ul>	<ul style="list-style-type: none"> <li>• Communities, systems, or infrastructure readily able to adapt or respond to change</li> </ul>	<ul style="list-style-type: none"> <li>• Vulnerable populations</li> <li>• Critical infrastructure</li> <li>• Critical natural systems</li> <li>• Areas of economic, historic, or cultural significance</li> </ul>
Economic Impacts	Low	Medium	High





# Working Under Uncertainty

## Analytical Approach

### Simplest

- Straight use of parameters
- Fewer models
- Limited characterization of uncertainty

### More Robust

- More GCMs
- Consideration of more scenarios
- Sensitivity analysis

### Most Robust

- Larger # GCMs
- More complete characterization of uncertainty



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# Resilient Decision Making Principles

- Prioritize actions that promote integrated climate action
- Prioritize actions that promote equity and foster community resilience
- Coordinate with local and regional agencies
- Prioritize actions that utilize natural and green infrastructure solutions and enhance and protect natural resources
- Base all planning and investment decisions on the best-available science.



## Related Initiatives

Legislation	Direction
SB 379	Requires climate change to be addressed in the Safety Element of General Plans
SB 246	Creates the Integrated Climate Adaptation and Resilience Program at OPR, which includes: <ul style="list-style-type: none"><li>• Technical Advisory Council</li><li>• Clearinghouse of information</li></ul>
AB 1482	<ul style="list-style-type: none"><li>• Requires updating of Safeguarding every three years</li><li>• Expands review authority of the Strategic Growth Council to include climate adaptation and non-member agencies</li></ul>
AB 2800	Establishes the Climate Smart Infrastructure Working Group



## A Few Challenges...

- Metrics and tracking progress
  - Accountability
  - Meeting programs objectives
  - Tracking climate impacts
- Integration of local knowledge
- Keeping up with changing science and knowledge
- Meeting agencies and departments where they are – from very advanced and resourced on down